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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/019,485	04/17/2002	Svend-Erik Mikkelsen	H0610.0000	1371

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EXAMINER
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TOOMER, CEPHIA D

ART UNIT	PAPER NUMBER
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1714

DATE MAILED: 11/03/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/019,485	MIKKELSEN ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Cephia D. Toomer	1714	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 8/4/06;6/29/06.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 12-15 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 12-15 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |  |
|--|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input checked="" type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application  |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                           |

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on August 4, 2006 has been entered.

RCE 8/4/06

2. This Office action is in response to the amendment filed June 29, 2006 in which claim 12 was amended.

### ***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claims 12-15 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The examiner does not find support in the specification nor does applicant point to the place in the specification wherein the

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limitation "the concentration of dimethyl ether is between 30 and 68% w/w, and the concentration of water is between 14 and 40 % w/w" is recited.

Applicant provides an example using 100 g of methanol at 50% conversion to explain how the disputed limitations were reached. Applicant's example is just that, an example. This example is not set forth in the specification and does not provide support for the claimed limitations.

### ***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 12-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Basu (US 6,270,541) in view of Applicant's admitted prior art, Ford Vehicles, Mendler (US 6,125,801) and Ceynow (US 5,440,880).

Basu teaches a diesel fuel composition comprising 70-95 wt % dimethyl ether, up to 20 wt % methanol and from 0.1 to about 20 wt % water (see abstract). Basu teaches that the fuel is used in a compression ignition engine with direct injection fuel system and fitted with an exhaust gas recirculation system (see col. 4, lines 61-67; col. 5, lines 1-4). Basu teaches the limitations of the claims other than the differences that are discussed below.

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In the first aspect, Basu differs from the claims in that he does not specifically teach that the dimethyl ether is present in an amount from 30-68 % w/w. However, Basu teaches that the ether is present in an amount of 70 % and a prima facie case of obviousness exists where the claimed ranges and prior art ranges do not overlap but are close enough that one skilled in the art would have expected them to have the same properties. *Titanium Metals Corp. of America v. Banner*, 778 F.2d 775, 227 USPQ 773 (Fed. Cir. 1985).

Basu fails to teach that the air for combustion is preheated to a temperature of at least 60 °C. However, Basu teaches that the diesel engine of his invention (col. 4, line 61 through col. 5, lines 1-4) is fitted with an exhaust gas recirculation system (EGR) and Applicant discloses at page 9, lines 4-7 that exhaust gas temperatures range from 200 °C to more than 500 °C and Ford defines EGR a system in which a portion of the exhaust gases are recirculated into the combustion chamber for additional burning. Mixing exhaust gases with a new air/fuel mixture helps reduce harmful nitrogen oxide emissions. Mendler teaches that the EGR feed line may be attached to intake air feed line engine either upstream or downstream of the intercooler. Ceynow teaches that air-to-air intercoolers may be combined with EGR to reduce intake manifold temperatures. It would have been obvious to one of ordinary skill in the art to preheat the air of combustion because the combined teachings suggest that the engine used by Basu contains all of the components necessary to preheat the air for combustion to at least 60 °C.

7. Applicant's arguments have been fully considered but they are not persuasive.

Applicant argues that fuels with different compositions and different concentrations do not possess the same ignition and combustion characteristics. Applicant relies upon Tables 3-9 of the present invention to support this argument.

The examiner is not disputing this issue. However, one skilled in the art would reasonable expect that a fuel composition comprising 70% dimethyl ether, up to 20% methanol and 0.1-20% water would possible the same or similar characteristics as a fuel composition that comprises 68 % dimethyl ether, 5-20 % methanol and 14 to 20 wt% water. Applicant has provided no data to dispute the examiner's position.

Applicant argues that *Titanium Metals Corp of America v. Banner* does not apply to the present invention because the 2% difference between the ether of Basu and the upper limit of the range of the claimed invention is significant.

The examiner recognizes that the proportions in *Titanium* differ by less than a tenth of a percent. However, in the instant case, a 2% difference in a composition containing such large amounts of the components is not as significant. Applicant has not provided any data comparing the present invention to Basu. Furthermore, Basu teaches about 70% of dimethyl ether. The term "about" affords flexibility to the proportions. Thus, about 70 % clearly reads on 68%.

Applicant argues that the mere mentioning of an exhaust gas recirculation system (EGR) by Basu and Applicant's disclosure of an exhaust gas temperature from 200 to 500 °C does not suggest the purpose of the heat content in the exhaust gas nor does it suggest using the heat of the exhaust gas to preheat the combustion air.

The combined prior art teaches that it is known to combine EGR with the new air/fuel mixture and that the exhaust gas is cooled to below 700 °F, preferably to 300 °F. Applicant has merely taken a known composition and used it in a known compression engine.

Applicant argues that Basu does not disclose test results that can be compared with test results of the present invention. Therefore, Applicant relies upon the fuels in Table 9 to argue unexpected results.


Basu exemplifies a composition comprising 94% dimethyl ether and the examiner agrees that this example should not be compared to the present invention. However, since one of the major differences between the present invention and Basu is the amount of dimethyl ether, it should not be a burden for Applicant to prepare a composition comprising 70% dimethyl ether and 2-20% methanol and 2-20% water (see Basu, abstract; claims 7 and 9) and compare this composition or compositions to the present compositions.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cephia D. Toomer whose telephone number is 571-272-1126. The examiner can normally be reached on Monday-Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu Jagannathan can be reached on 571-272-1119. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

  
Cephia D. Toomer  
Primary Examiner  
Art Unit 1714

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